

Docket No.: 063979-0026



IFW *CoFL*
PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of	:	Customer Number: 20277
	:	
Hideyuki TANAKA, et al.	:	Confirmation Number: 3022
	:	
Application No.: 10/608,130	:	Group Art Unit: 2818
Patent No.: 6,844,564 B2	:	
	:	
Filed: June 30, 2003	:	Examiner: Andy Huynh
Issued: January 18, 2005	:	
	:	
For: NON-VOLATILE MEMORY	:	

REQUEST FOR CERTIFICATE OF CORRECTION UNDER 37 CFR 1.322

Mail Stop Box 4 / Certificate of Correction
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In reviewing the above-identified patent, a printing error was discovered therein requiring correction in order to conform the Official Record in the application.

The error noted is set forth on the attached copy of form PTO-1050 Rev. 2-93 in the manner required by the Commissioner's Notice.

Specifically, in the claims, Column 13, line 13 of Claim 1, change the phrase "single memory cells" to -- **single memory cell** --. Enclosed is a copy of Applicant's amendment filed August 18, 2004, showing the correct version of the phrase.

The change requested herein occurred as a result of printing the Letters Patent and the Certificate should be issued without expense under Rule 322 of the Rules of Practice. Accordingly, Applicants request issuance of the Certificate of Correction.

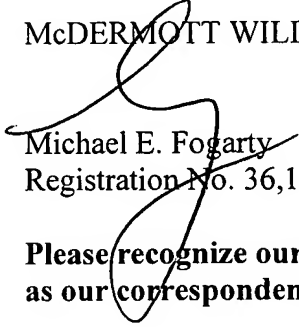
10/608,130

Patent No. 6,844,564 B2

Please charge any shortage in fees due in connection with the filing of this paper to Deposit
Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

McDERMOTT WILL & EMERY LLP



Michael E. Fogarty
Registration No. 36,139

600 13th Street, N.W.
Washington, DC 20005-3096
Phone: 202.756.8000 MEF:BD
Facsimile: 202.756.8087
Date: March 21, 2005

**Please recognize our Customer No. 20277
as our correspondence address.**

WDC99 1057345-1.063979.0026

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 6,844,564 B2

DATED : January 18, 2005

INVENTOR(S) : Hideyuki TANAKA, et al.

It is certified that error appears in the above-identified patent and that said Letter Patent is hereby corrected as shown below:

IN THE CLAIMS:

Column 13, Claim 1, line 13, change "single memory cells" to -- single memory cell --.



10/608,130 - NEW

Applicant: Hideyuki TANAKA, et al. Docket No. 63979-026 Serial/Reg./Patent No. 10/608,130

Title: NON-VOLATILE MEMORY

Date Sent: 8/18/2004 ☒ Hand Carried ☐ Fax ☐ Electronic ☐ Cert. of Mailing ☐ First Class Mail ☐ Express Mail No. _____

☐ Transmittal Letter

☐ New Patent App ☐ Utility ☐ Design ☐ Cont. ☐ CIP ☐ Div. ☐ PCT ☐ RCE ☐ Prov

☐ Other: _____

_____ pages of Specification

_____ pages of Claims

_____ pages of Abstract

_____ pages of Formal/Informal Drawings

☐ Small Entity ☐ Large Entity

☐ Declaration/Power of Attorney

☐ Recordation of Assignment/Security Agreement

☐ Information Disclosure Statement

_____ Form PTO 1449

_____ copies of cited references

☐ Preliminary Amendment

☐ Response to Missing Parts Notice

☐ Resp. to Notice to Correct App. Papers

☐ Certified Copy of Priority Doc.

☐ Claim for Convention Priority

☒ Response/Amendment to Office Action of 5/18/04

☐ Request for _____ month Extension of Time

☐ Letter submitting _____ pages of drawings

☐ Req. for Approval of Drawing Amendments

☐ Req. for Oral Hearing

☐ Not. of Appeal ☐ Appeal Brief ☐ Reply Brief

☐ Rule 312 Amendment/Letter

☐ Req. for Acknowledgement of Cited Art

☐ Issue Fee

☐ Publication Fee

☐ Req. for Certificate of Correction

☐ Maintenance Fee for _____ years after grant

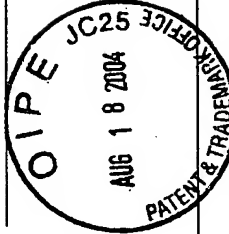
☐ Fee Address Indication Form

☐ Terminal Disclaimer

☐ Petition to Commissioner

☐ Status Inquiry

☐ Other _____



Check for \$	<input type="checkbox"/> Charge Deposit Acct. 500417\$	Atty Init.	RMF	Tkpr. #	5328	Secy. or PL:	MMcZom
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CMS Descrip.: _____

THE PATENT AND TRADEMARK OFFICE DATE STAMPED HEREON IS ACKNOWLEDGEMENT THAT THE ITEMS, CHECKED ABOVE, WERE RECEIVED BY THE PTO ON THE DATE STAMPED.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of : Customer Number: 20277
 Hideyuki TANAKA, et al. : Confirmation Number: 3022
 Serial No.: 10/608,130 : Group Art Unit: 2818
 Filed: June 30, 2003 : Examiner: Andy Huynh
 For: NON-VOLATILE MEMORY



Mail Stop Amendment
 Commissioner for Patents
 P.O. Box 1450
 Alexandria, VA 22313-1450

Dear Sir:

Transmitted herewith is an Amendment in the above-identified application.

- ☒ No additional fee is required.
☐ Applicant is entitled to small entity status under 37 CFR 1.27
☐ Also attached:

The fee has been calculated as shown below:

	NO. OF CLAIMS	HIGHEST PREVIOUSLY PAID FOR	EXTRA CLAIMS	RATE	FEE
Total Claims	13	20	0	\$18.00 =	\$0.00
Independent Claims	1	3	0	\$86.00 =	\$0.00
Multiple claims newly presented					\$0.00
Fee for extension of time					\$0.00
Total of Above Calculations					\$0.00

- ☐ Please charge my Deposit Account No. 500417 in the amount of \$0.00. An additional copy of this transmittal sheet is submitted herewith.
- ☒ The Commissioner is hereby authorized to charge payment of any fees associated with this communication or credit any overpayment, to Deposit Account No. 500417, including any filing fees under 37 CFR 1.16 for presentation of extra claims and any patent application processing fees under 37 CFR 1.17.

Respectfully submitted,

MCDERMOTT WILL & EMERY LLP

Ramyar M. Farid
 Registration No. 46,692

600 13th Street, N.W.
 Washington, DC 20005-3096
 202.756.8000 RMF:mcm
 Facsimile: 202.756.8087
 Date: August 18, 2004



Docket No.: 63979-026

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of	:	Customer Number: 20277
Hideyuki TANAKA, et al.	:	Confirmation Number: 3022
Serial No.: 10/608,130	:	Group Art Unit: 2818
Filed: June 30, 2003	:	Examiner: Andy Huynh
For: NON-VOLATILE MEMORY	:	

AMENDMENT

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In response to the Office Action dated May 18, 2004, having a three-month shortened statutory period for response set to expire on August 18, 2004, reconsideration of the above-identified application is respectfully requested in view of the following amendment and remarks.

IN THE CLAIMS:

1. (Currently Amended) A non-volatile memory comprising:

an insulating substrate having a plurality of first electrodes extending therethrough from a front surface of the substrate to a rear surface thereof,

[[a]] one or more second electrode electrodes formed on one surface side of the substrate,
and

a recording layer held between the first electrodes and the second electrode and variable in resistance value by electric pulses applied across the first electrodes and the second electrode,

the plurality of first electrodes being electrically connected to the recording layer in a region constituting a single memory cell, ~~X~~

wherein the first electrodes are filled respectively in a plurality of fine pores formed in the insulating substrate, the fine pores being formed by irradiating the insulating substrate with a beam of ion or neutron high-energy particles perpendicular to the front surface thereof to produce defects in the insulating substrate, and selectively etching the defects produced.

2. (Cancelled)

3. (Currently Amended) The non-volatile memory according to claim 1 wherein the one or more second electrodes are provided in the form of stripes, and third electrodes are provided in the form of stripes on the other surface side of the insulating substrate and extend orthogonal to the second electrodes when seen from above, each of the third electrodes being electrically connected to at least some of the first electrodes, the second electrodes and the third electrodes forming laps when seen from above to provide memory cells in the respective regions of the laps.

3 4. (Original) The non-volatile memory according to claim 1 wherein the recording layer comprises a phase-change material having at least two stable phases different in resistance value and capable of being reversibly switched between the phases.

4 5. (Original) The non-volatile memory according to claim 4 wherein the phase-change material contains a chalcogenide material.

5 6. (Original) The non-volatile memory according to claim 1 wherein the first electrodes are randomly arranged relative to the insulating substrate.

b 7. (Currently Amended) The non-volatile memory according to claim 1 wherein the plurality of first electrodes are electrically connected to the recording layer in a plurality of regions constituting a plurality of memory cells, respectively, the memory cells are being different in the number of first electrodes contained therein.

7 8. (Original) The non-volatile memory according to claim 7 wherein each of the memory cells contains 0.5×10^1 to 4×10^3 first electrodes on the average.

8 9. (Original) The non-volatile memory according to claim 1 wherein each of the first electrodes has a diameter of 5 to 500 nm.

10. (Currently Amended) The non-volatile memory according to claim 1 wherein assuming that S1 is the total area of contact of the portions of the ~~intermediate~~ first electrodes contained in the

9 optional memory cell with the recording layer and that S2 is the area of the recording layer contained in the optional memory cell, S1/S2 is in the range of 10^{-4} to 10^{-1} .

10 11. (Original) The non-volatile memory according to claim 1 wherein the recording layer comprises Ge-Sb-Te, and each of the first electrodes comprises at least one of rhodium (Rh), platinum (Pt), palladium (Pd), nickel (Ni), cobalt (Co), chromium (Cr), rhenium (Re), iridium (Ir) and gold (Au).

11 12. (Original) The non-volatile memory according to claim 1 wherein the insulating substrate is a polycarbonate substrate.

13. (Original) A paper display comprising the non-volatile memory according to claim 1.

REMARKS

Claims 3, 7, 8 and 10 stand rejected under 35 U.S.C. § 112, second paragraph. It is respectfully submitted that the claims, as amended, are definite so as to obviate the Examiner's concerns. Accordingly, it is respectfully requested that the rejection under § 112, second paragraph be withdrawn.

Claim 1 is the sole independent claim and stands rejected under 35 U.S.C. § 102 as being anticipated by Lowery et al. WO '498 ("Lowrey"). The indication of allowable subject matter in claim 2 is acknowledged and appreciated. Solely in order to expedite issuance of the present application, claim 2 has been canceled and claim 1 has been amended, without prejudice or disclaimer to the subject matter of claim 1, to include what is believed to be the allowable subject matter of claim 2. Accordingly, it is respectfully submitted that all pending claims are in condition for allowance.

Under Federal Circuit guidelines, a dependent claim is nonobvious if the independent claim upon which it depends is allowable because all the limitations of the independent claim are contained in the dependent claims, *Hartness International Inc. v. Simplimatic Engineering Co.*, 819F.2d at 1100, 1108 (Fed. Cir. 1987). Accordingly, as claim 1 is patentable for the reasons set forth above, it is respectfully submitted that all claims dependent thereon are also patentable. In addition, it is respectfully submitted that the dependent claims are patentable based on their own merits by adding novel and non-obvious features to the combination.

Having fully responded to all matters raised in the Office Action, Applicants submit that all claims are in condition for allowance, an indication for which is respectfully solicited. If there are

10/608,130

any outstanding issues that might be resolved by an interview or an Examiner's amendment, the Examiner is requested to call Applicants' attorney at the telephone number shown below.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

MCDERMOTT WILL & EMERY LLP



Ramyar M. Farid
Registration No. 46,692

600 13th Street, N.W.
Washington, DC 20005-3096
202.756.8000 RMF:mcm
Facsimile: 202.756.8087
Date: August 18, 2004

WDC99 965611-1.063979.0026